

ABSTRACT

A proximity sensor for sensing an object in the path of or proximate to a closure panel such as a vehicle window. First and second electrodes encased in a non-conductive casing are mounted on the metallic structure near the closing edge of the aperture. The two electrodes define a capacitance $CE1/2$ therebetween, and parasitic capacitances $CE1$ and $CE2$ between the first electrode and chassis ground and the second electrode and chassis ground, respectively. A controller cyclically connects (1) the second electrode to a voltage reference source (V_{ref1}) and the first electrode to chassis ground and (2) the second electrode to chassis ground and the first electrode to the reference capacitor, thereby periodically charging the capacitance $CE1/2$ and transferring the charge stored thereon to the reference capacitor whilst short-circuiting the parasitic capacitances. The charge on the reference capacitor, the time period required to charge the reference capacitor to a specified voltage, or a calculated value for $CE1/2$ are then compared against a reference value in order to derive an obstruction signal.